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DEVOTED EXCLUSIVELY TO CITRUS FRUITS

Issued Monthly
Representative of every interest—
Representing no special interest

Vol. 3 No. 8

TAMPA, FLA., AUGUST, 1922

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U. S. Department of Agriculture

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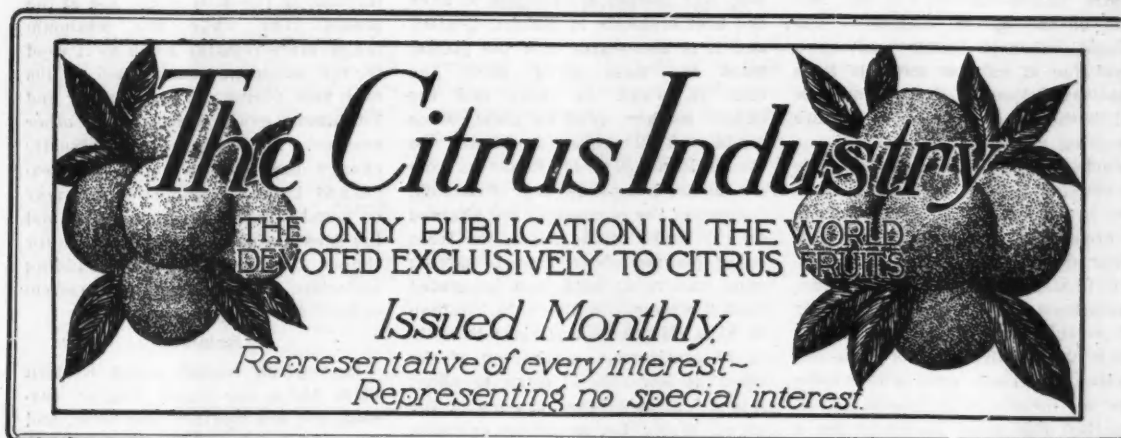
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Vol. 3

TAMPA, FLORIDA, AUGUST, 1922

No. 8

The Kao Pan Seedless Siamese Pummelo and Its Culture

Siam has long been noted for its delicious pummelos or grapefruit, many varieties of which are produced for both home consumption and export, among which the so-called seedless Nakorn Chaisri or Kao Pan pummelo is considered the best by the natives of Siam. A successful introduction of bud wood of the true Nakorn Chaisri seedless pummelo or grapefruit has been made into the United States and and it is thought by authorities that this variety may prove adaptable to the Everglades and swamp lands in Florida.

A recent issue of the Philippine Journal of Science carries an interesting sketch of the history and development of this variety of Siamese grapefruit and many facts concerning its successful culture according to the most approved Siamese methods. This article, parts of which we are reproducing below, was written by A. O. Reinking, Professor of plant pathology and plant pathologist of the College of Agriculture and Agricultural Experiment Station, Los Banos, Laguna, Philippine Islands; and collaborator, Crop Physiology and Breeding Investigations, United States Department of Agriculture, Washington, D. C., together with G. W. Groff, Professor of horticulture and director of agricultural work, Canton, China, and field assistant, Crop Physiology and Breeding Investigations, United States Department of Agriculture, Washington, D. C.

Of late years the Kao Pan seedless

pummelo from Nakorn Chaisri has created a good deal of interest in the United States due to the investigations of Mr. Walter T. Swingle, of the Division of Crop Physiology and Breeding Investigations of the Bureau of Plant Industry, Washington, D. C. During the past eight years attempts have been made to introduce this and other Siamese grapefruit into the United States and the Philippines but the trees upon being transplanted from their native habitat produce a fruit poor in quality and abundant in seeds.

Investigations were made in June and July of 1920, through the cooperation of the Division of Crop Physiology and Breeding of the Bureau of Plant Industry, Washington, D. C., with the College of Agriculture of the Philippines, Los Banos, Philippine Islands, and Canton Christian College, Canton, China. The objects of this investigation were to make a complete study of the real seedless pummelo, to determine the relation existing between the salting and cultural practices in relation to quality and seedlessness; to obtain varieties resistant to canker and to make a study of plant diseases and insect pests attacking the trees. A direct result of the investigation has been a successful introduction of bud wood of the true Nakorn Chaisri seedless pummelo into both the Philippine Islands and the United States. A small tree of the variety also was taken to the Philippines.

The low-lying region of Nakorn

Chaisri is well located for the production of citrus fruits, and the inhabitants of this and other regions have a large number of recognized varieties. Their pummelos can readily be classified into two main types, the round and the elongated. The most characteristic and best fruit of the first class is the so-called seedless Kao Pan. The second class is represented by the Kao Phuang, a pear-shaped, elongated fruit produced in the Dao Kanong region. The latter is not so highly appreciated in Siam and is grown chiefly for export. The present paper is confined to the Kao Pan variety although a study and collection of almost all of the important varieties has been made.

History

In Nakorn Chaisri the growers recognize the Kao Pan as a distinct variety and claim, not without substantiation throughout the country, that when it is grown under conditions other than those found in Nakorn Chaisri that the fruit soon loses its delicious qualities. This variety is widely known throughout the region though a few growers along Tachin River are especially famous for their successful production. These studies were made on the plantation of Nang Nui and her husband, Nai Ha.

The people of this part of Siam have been greatly influenced by the Chinese from Southern China who have settled in Siam for generations, bringing with them conspicuous features of the Chinese civilization and

greatly influencing the life and customs of the native Siamese. The Chinese, through their advanced knowledge of cultural methods have doubtless helped to develop and establish the present strains which are attracting world-wide attention.

Much of the business, especially in the country districts of Siam, is managed by women. One of these women orchardists stated that this particular fruit had been known in Nakorn Chaisri for only three or four generations. This woman's family had grown fruit for fifty years and her mother claimed that not more than one hundred years ago only a few trees grew on their side of Tachin River. The Kao Pan may, therefore, be a distinct variety of comparatively recent origin.

Topography.

The Nakorn Chaisri district is in the southern part of the central division of Siam. This division is characterized by being a vast plain of about 55,000 square miles stretching from the mountainous border of Burma and extending eastward to the high ridges marking the boundary of Cambodia. The plain extends southward to the Gulf of Siam, being at a very slight elevation above the sea and is subject to regular annual river floods which, by the deposition of vast quantities of silt, are slowly raising the general level. The whole area slopes downwards from north to south and falls slightly away at right angles to the banks of the rivers which flow on slight ridges of their own alluvial accumulation. There is abundant evidence that within recent geological times the sea flowed over a great part of the plain and even now the northern shores are advancing seawards at the surprising rate of almost a foot a year.

The Nakorn Chaisri section is in the delta region of the Menam Chao Phaya. In this region the waters usually begin to rise in May and continue to do so until about the end of October, when the river is in full flood. Subsidence is gradual and the lowest level is reached in April. Sudden freshets and high rises are unknown.

The river is subject to a strong tidal influence for a distance of 80 kilometers inland. The action of the tide is greatly influenced by the flood time of the year. During the dry weather the tidal flow extends far inland and in the lower parts of the river the water is brackish.

The Kao Pan is grown and produced in its best seedless and most excellently flavored form only in Ben Mai, Sarm Prarm, Nakorn Chaisri. The

Ban Mai section is reported to have the best orchards in Nakorn Chaisri, and it is also stated that the plantations are most noted, being the ones to which the king and the queen mother send for their choice fruits. This section is located on Tachin River, 30 or 40 kilometers from the mouth, lying southwest of Bangkok.

Some of the plantations are situated on the banks of the River, the trees being planted about 7 to 10 meters from the river bank and separated from the river by a dike. During June at high tide the water rises to within 30 centimeters of the top of the dike; at low tide it sinks to about 2 or 2.5 meters below the top of the dike. Water for irrigation is taken directly from the river in such cases. Other plantings may be situated farther from the river, those studied being some 100 to 150 meters removed.

Tachin River was at one time a branch of the Menam Chao Phaya, but in recent years the source of the river has been almost entirely cut off from the main river. The severance of the connection, because of lack of a large supply of fresh water from its source, had a great influence upon the salty nature of the Tachin.

Climate.

The temperature of Siam, though the country lies entirely within the northern tropic, is considerably affected by peculiar local conditions and therefore varies very perceptibly in different localities. On the plains of Central Siam, between the months of February or March and October, the sea wind blows from the south or southwest almost continuously, mitigating the heat of the days and rendering the nights comparatively cool. During this period, which comprises the hot and rainy season, the temperature rarely raises above 98 degrees fahr, or falls below 79 degrees fahr. From the end of October to February, the so-called cold season the wind blows from the northeast when the maximum temperature may reach 92 degrees fahr, and the minimum fall as low as 54 degrees fahr. Formerly the climate of Bangkok city was very similar to that of the surrounding plains but during the last few years a change has become noticeable. Sir John Bowring in his book on Siam, gives statistics of the temperature of Bangkok over the period 1840 to 1847, during which the maximum temperature registered was 97 degrees fahr, and the minimum 54 degrees. Observations of a much later date give results very similar to the above but statistics of the last ten years or so show an almost continual

increase in the daily range and at the present time, while the minimum temperature remains much as it used to, the maximum reaches 105 or 106 each year during the hot weather and 100 almost every month of the other seasons. The causes of this climatic change have not hitherto been explained but it is possible that they may be found in increase of population and the substitution of bricks and tiles for timber and thatch as house building materials, or in the draining of marshes in and around the city.

Rainfall.

In Central, Northern and Eastern Siam there are three distinct seasons, the hot weather, the rains, and the cold weather. The first extends from February or March to May, the second from June to October, and the third covers four months of the year. When the northeast winds blow strong, the weather is very marked and, though the actual temperature is not below the average summer heat of Europe, causes some inconvenience to the people of that country. At times however, the seasonal winds fail and when this happens the cold weather is scarcely to be distinguished from the hot.

The rainfall of Siam varies a good deal in the different parts of the country. In Southern Siam and on the Chantaburi coast the average is not far short of 100 inches for the year; in Northern Siam it is about 60 inches and in the neighborhood of Bangkok about 50 inches.

The comparative smallness of the rainfall in Central Siam is undoubtedly due to the influence of the great western mountain ranges which gather the clouds of the southwest or rain-bearing monsoon, and cause the precipitation on their summits and slopes of the greater part of the rain which would otherwise be distributed more equally over the whole country. The rainfall is not entirely confined to the wet season, for in the neighborhood of Bangkok showers fall at intervals during the cold and hot seasons, while towards the west and in Southern Siam the fall amounts to several inches during the hot months. Snow never falls anywhere in Siam, not even upon the highest mountain peaks of the north but hailstorms, though of very rare occurrence, are not altogether unknown. The beginning of the wet season is usually heralded by a series of severe squalls and thunderstorms accompanied by heavy rain, which sweep down from the western heights and sometimes cause damage to property on the plains. During the months of September and October,

heavy gales almost of cyclonic violence are met with in the gulf, and waterspouts are occasionally seen both at sea and over the flooded marshes of the plains.

Irrigation

The water used for irrigation is, excepting during the rainy season, supplied from the Tachin River; ditches being made from the river to the orchards. The water is rather muddy, being filled with clay loam, and is reported to be quite salty during the months between January and February and July. The saltiness depends upon the beginning and extent of the rainy season. It was found by means of a number of analyses that the water in Tachin River at high tide at Ban Mai, Nakorn Chaisri, approaches sea water in salt content.

In order to get a comparison of the water used for irrigation in other pummelo sections of Siam, a sample was taken from the Menam Chao Phaya at Bank Bakok, near Bangkok. This section is chiefly famous for its production of the Kao Phuang variety of pummelo, other varieties being also grown. The Nakorn Chaisri seedless, or Kao Pan, variety when grown at Bang Bakok does not produce such excellent fruit, the seedy character being reported to be greater. The water at Bang Bakok was said to be salty from about February to May, usually becoming fresh in June when the rain begins. The analysis of water used from Menam Chao Phaya River at Bang Bakok contained only an amount of salt normal for river water.

The results obtained show that there is a great difference in the salt content, at least during early June at which time these analyses were made, in the two sections. This would indicate that the salt content of the two rivers is different throughout the year and that the salt has some influence on the quality and possibly the seediness of the fruit.

Ban Mai is situated on Tachin River about 40 kilometers from the Gulf of Siam and here the people report that they can drink the river water for only 6 months of the year. At Tachin, which is 5 to 6 kilometers from the gulf, the people report that they can drink the water for only 2 months of the year. Sixty kilometers up the river from the gulf the people report that they can drink the water for 8 or 9 months of the year. This would indicate that the river is salty for a least 6 months of the year at Ban Mai, and according to the analysis, it is extremely salty even during June. Before any definite state-

ment can be made in regard to the effect of salt on the quality of fruit produced, further carefully controlled experiments would have to be made but enough evidence has already been collected to indicate that the salt does have some influence on the quality of the fruit.

Soil

The general character of the surface soil in the delta region is heavy, clayey, and of an entirely alluvial formation. The subsoil is a heavy gray, brick clay, which is rather impervious to water. The topsoil in Ban Mai orchards is a dark gray to grayish brown clay to clay loam soil with some grit and sand present. Little sand was found in any of the samples. The subsoil is a very sticky, light slate, brown clay. Mud from the canals, which is used for fertilizer, being a decomposition of organic material, is light brown, slaty in tint, clay to sandy clay, with some grit. Resulting analysis show the soils to contain over 50 per cent of clay, running extremely high in salt content. Samples of soil in orchards at Bang Bakok show a less heavy soil with more sandy grit which gives a coarser texture. Analysis showed only a small amount of salt content in soil from the Bang Bakok region. These comparative tests indicate a difference in the salt content of Ban Mai and Bang Bakok soils in addition to the widely different amount of salt found in water used for irrigation at both places. Chemical tests show an excessive amount in both the water and soil producing the best quality pummelos. Tests on the salting of trees seem to confirm the belief that there is a direct relation between the quality of the fruit produced and the amount of salt contained in the soil and water.

Cultural Methods

The type of citrus culture used in Nakorn Chaisri is exceedingly well adapted to the low, wet, mud flats and nipa swamps of the region. The methods followed are largely those employed by the Chinese in the successful growing of fruit in the flood swept delta regions of southern China. This method, almost unknown in the West, deserves careful consideration being of possible use in developing many otherwise useless swamp areas of other parts of the world.

Nakorn Chaisri is irrigated, drained, and sometimes flooded by the waters of Tachin River. This swamp area was originally covered with nipa palm and other growths adapted to wet, and salty conditions. Natural arteries

leading to the main stream are insufficient for adequate drainage so artificial channels have been dug, until the whole area is now a network of small canals and waterways. These canals also provide a series of artificial highways useful to the natives for transporting their fruit to market in canoes. These open waterways used for drainage, are ineffectual in holding back the surplus water when the main streams are in flood so a system of dikes is used to protect the cultivated area. After clearing, the nipa swamp is encircled with mud dikes thrown up along both main and branch streams. In the clearing, a narrow strip of land along the shore of the stream is left in natural growth, this fringe of vegetation prevents washing of the banks. Along the smaller waterways the dikes are constructed next to the stream but in many cases a catch basin is dug between the fringe of trees and the dike. Earth at the base of the dike is held in place by planting with some growth whose roots endure constant flooding. The plot is then laid out to a series of raised beds and ditches with the beds usually running parallel with the stream. Under the dike of the first bed there is laid the hollow trunk of a palm tree or terra cotta pipe through which water can pass from the canal to the ditches. Water-gates are constructed under the dikes at regular intervals to carry the high tide-water of the dry season to the growing plants. Simple bridges of bamboo or the trunk of a coconut tree are placed across the stream.

Pummelos are not planted for five years after the inclosure is first plotted. This allows time for the raising and settling of the beds, as the canals are dug deeper and the beds thrown up higher each year, and also permits the decay of organic matter and the planting of preliminary growth. Bananas, sugar cane, corn, beans and peanuts are usually grown to mellow the soil.

Intercropping

Little scientific experimental work has been done on the effect of shade upon citrus plantings. That some shade is advantageous under tropical conditions is evident from the experience of native growers. In Nakorn Chaisri there seems to be considerable intercropping, partly with a view to providing shade, and numerous trees of other species are found planted in the groves, sometimes uniformly and sometimes at random. The coconut palm, the betel palm and the banana are most frequently used.

Eight

Betel palms are most conspicuous and are said to be very profitable. They seem to thrive under this peculiar system of cultivation and are often found fringing the edge of citrus beds. Banana plants are often grown between the betel palms and pummelos. A Siamese grove never appears to have the regularity of a systematically planted western orchard, though some of the best ones approximate it.

There seems to be considerable difference of opinion among the growers as to the extent to which intercropping and shading prove profitable. In one instance it was noted that when the trees had reached the age of ten or fifteen years, nearly all of the betel palms and bananas had been gradually removed.

Another form of intercropping which is customary is the growing of rice in the ditches, a row or two down either side of the citrus beds. The rice is set out at the beginning of the rainy season and not only utilizes otherwise useless space but helps keep intact the sides of the beds.

Cultivation

Clean culture is practised on the orchard beds of Nakorn Chaisri and little difficulty is experienced with weeds. Rarely is any effort made to maintain an earth mulch as the constant supply of water in the trenches makes this exertion unnecessary. Mulch, however, which has been cleaned out of the trenches is smeared over the surface of the beds and allowed to crack during dry weather. All organic matter and clay that may have rotted and accumulated in the ditches, such as dead leaves, straw and branches is carefully removed and used for fertilizer. When the water becomes low in the trenches, mud from the bottom is removed and placed along the sides of the dikes. After thoroughly drying in the sun, it is broken up into pieces, carried to the beds in baskets and placed about the trees, usually two large basket-full being considered sufficient for each tree. It is evident from what has been said previously that the trees under this culture develop a surface root system and this mud prevents exposure and provides a source of plant food.

Some interesting theories have developed regarding the effect of salt and paddy ash upon the seediness and what is known as the kao sarn, or raw rice condition of the fruit. It has been stated that if salt and paddy ash, (the residue or burned rice husks), are applied to trees bearing bitter fruit or fruit lacking in juice,

THE CITRUS INDUSTRY

that the following year the fruit will be much improved and will contain fewer seeds. Kao sarn, or the raw rice condition of the fruit, is caused by the tendency in imperfect fruits of the juice sacs to harden. Soil and fertilization are said to be the chief causes of this and paddy ash is said to greatly reduce its occurrence. Paddy ash is obtained from the rice mills where the husks are burned for fuel and the ashes dumped as useless. It is applied to the surface of the beds, small piles being placed under the trees and allowed to work to the roots gradually. It is a valuable source of potash. Night soil is sometimes used but not to the same extent that it is in China. Small holes are dug in the beds and night soil poured in and allowed to find its way to the roots.

Pruning and Propagation

Growers pay little attention to pruning, except to cut out all dead branches. Shapely, low-headed trees are considered just as important as in any western grove. Trees of this shape are obtained not by pruning but by careful selection of suitable branches for layering. These are so planted as to have the forked head only a few centimeters above the ground. In old pummelo groves very severe cutting back is practiced.

Western methods of propagating citrus have never been introduced into Siam, and the methods followed are mostly those used by the Chinese. In northern Nakorn Chaisri the pummelos are multiplied by marcottage, or Chinese air layering. Owing to the scarcity of nurseries, each grower usually propagates his own stock. The average price for a layered plant is 30 to 40 cents in United States currency.

Marcottage is practiced in June or July, and August, after the rains have begun. A strip of bark is removed from the branch chosen. After a slight callus has formed, coconut fiber or specially prepared earth is tied about the injured part. During dry weather this must be kept moistened. About one hundred days are necessary for the roots to form. The new plant is then removed from its parent plant and set out in a nursery or, more often, is planted in permanent position. Branches chosen for this purpose are usually very much forked, and low-headed, spreading trees result.

Flowering and Harvesting

The Kao pan, like most citrus trees in this region, flowers in most abundance four times a year. The largest numbers of flowers appears in June, at the beginning of the rainy

season. This lot of flowers matures the largest crop of fruit. Five to six months are required to bring the fruit to maturity, the largest crop being picked in November and sold direct or placed in storage.

Trees of this variety are said to reach their maximum production at the age of fifteen years and to have outlived their usefulness at thirty years. Judging by the number of fruits seen on the trees during an off season, trees of this variety must be heavy bearers. The yield from a grove of about 400 bearing trees was, approximately 18,000 fruits each year, which would give an average of 45 fruits for each tree. Of these about 10,000 were harvested in November, 4,000 in February, and 2,000 in both May and August.

The November crop is graded as there is considerable variation in quality and seediness. Fruit picked at the other three seasons, about three to four months apart, are superior in quality and rarely have seeds. Color and size are the chief points considered in picking as the main crop is picked just before the fruit is mature. At this stage it has attained its natural size, but is still somewhat green, just starting to turn yellow. If the fruit is allowed to mature on the trees, the raw rice condition mentioned is apt to develop.

Storage

Storage and care are important factors in producing the best quality fruit as storing improves the flavor. After storage of from one to two months, the skin is soft, fragrant, distinctly yellow and much wrinkled. Fruit can be stored in a dry place for three months and will be found then to be juicier than at the time of picking. Fruits are stored in bamboo baskets and placed on rafters under a nipa-palm roof house or else piled on the floor in large heaps in a specially constructed bamboo storage houses. Little or no rotting occurs during storage except when the fruit is roughly handled.

Before marketing, the fruit is graded according to size, degree of cankeredness and seediness. Fruit is carried to market in small, native canoes or sold to middlemen who come direct to the plantations.

Diseases

The Kao Pan variety is extremely delicate and consequently apt to be attacked by canker and other diseases and pests. The trees need constant attention and care but with these, excellent results can be ob-

Citrus Fruits 'Round the World

(Extracts from the Department of Commerce Reports)

Orange Groves of Holy Land Blooming Again.

Once again, the orange groves of Palestine are bearing, the last three years having accomplished much to amend the war damage. During the 1921-22 season, just closed, 1,100,000 cases of the delicious Jaffa oranges were shipped out of that country, Consul Addison S. Southard of Jerusalem has informed the Department of Commerce. Good prices for the crop enabled many of the grove owners to buy new irrigation pumps and engines to replace old installations badly deteriorated during the war.

California packing methods have been installed by American capital, and growers have formed combinations for the marketing of their crop abroad. The outlook for increased prosperity now that the groves are bearing again is considered very favorable.

Competition for American Oranges

American oranges on the London market will soon have serious competition from oranges from the opposite side of the earth if the plans of several of the Australian states go through, according to information just received by the Department of Commerce from the American Consulate at Sydney. Bitter experience has prompted many of the Australian growers to abandon individual exports and now a cooperative scheme between the growers and the state officials, with the active assistance of the railroads and steamship lines, has been agreed upon, whereby special attention will be given to standardization and methods of packing. Only navel oranges are to be used, and standard California orange boxes are specified. Every orange will be wrapped in grease-proof paper with a kangaroo stamped on each wrapper, and as a further means of holding the identity of the Australian fruit a kangaroo design will be stenciled on each box. Even the railroad employees are being drilled by the state agricultural departments to handle with reverence these boxes with the kangaroo design.

Unsuccessful Fruit Shipments from Australia.

Australia's recent experience in

sending fresh fruit to England has been a sad one, for shipments within the last few months have been turning out badly. Peaches, pears, and apples have arrived in a frozen condition, and according to Mr. R. H. Fisher of the American Consulate at Sydney, Australia, passion fruit was mildewed and unsaleable. A consignment on one steamer did not contain a single case in first class condition, and the reason ascribed was ineffective refrigeration with low and variable temperatures.

Even at its best, the Australian fruit has to compete with the popularity of South African fruit in English markets. The cooking pears which arrived in a slightly better condition were outshaded by the huge South African cookers.

To Study Tropical Plant Culture

Experiment stations have recently been put into operation by the government of the Dutch East Indies at a dozen points throughout the islands where practically every phase of tropical agriculture will be studied. Consul Parker W. Burhman, Java, has informed the Department of Commerce.

The important results obtained by the agricultural experiment stations of the United States Department of Agriculture scattered all over this country have no doubt lent a helping influence to the decision of the Dutch East Indian government to make a scientific study of the growing of coffee, tea, cocoa, rubber, tobacco, sugar cane, and the other tropical products which grow there so profusely.

New Zealand's Fruit Growing Industry

Every effort is being made by agricultural interests of New Zealand, with the cooperation of the Department of Agriculture, to improve the quality of fruits for export trade, and the prospects for overseas business seem particularly good at this time, Consul General Wilbur, Wellington, has informed the Department of Commerce.

"Prior to the War," he states, "there was a good export demand for New Zealand fruit, but since 1916 all markets outside of the Empire have ceased. South American countries have long been considered as the logical market for New Zealand's surplus

and oversize fruit, and in spite of unsteady financial conditions and poor freight facilities, two contracts of an experimental nature have just been closed.

"Thousands of crates of apples and pears were exported to Great Britain during April, arriving in good condition, and the industry hopes to greatly increase its foreign trade along with the development of more perfect fruit."

Fruits Now Coming From Brazil

Santos, the world's greatest coffee port, is taking on a side line in the exportation of tropical fruits to the United States. Last month several hundred cases of Brazilian oranges, tangerines, pineapples, and alligator pears were shipped to New York. Heretofore, very little attention has been paid to the orange and other fruit trees, but should this experimental shipment prove a success, Consul H. W. Goforth, Santos, informs the Department of Commerce that there is a little doubt that the present quality and appearance of the fruit can be greatly improved and a trade of considerable proportions developed.

SPRAY WITH BORDEAUX MIXTURE TO CONTROL FIG RUST

Fig rust is a disease that is likely to occur during the latter part of summer, and cause the trees to lose their foliage, according to the Florida Experiment Station.

The disease is recognized by numerous small, raised, reddish-brown spots which are covered with a golden yellow powder. This powder is the rust spores which forms on the under surface of the leaves. On the upper surface of the leaves the small spots are dark brown and somewhat smooth.

This rust does not appear on the leaves until the fruit has reached maturity so it does not interfere with the production of a crop. However, the growth of the tree is materially affected when the foliage is lost.

The best treatment for the disease is to spray with bordeaux mixture, 4-450 formula, when the first rust spots appear. In addition rake up and destroy all fallen leaves.

The Citrus Industry

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NO CITRUS SEMINAR THIS YEAR

Citrus growers generally will be disappointed to learn that there will be no citrus seminar this year. Officials of the state university at Gainesville have announced that owing to lack of funds for bearing the expense of the gatherings, neither the citrus seminar nor the livestock round-up, which for many years have been held at the University during the early days of October, will be held this year.

While many growers have felt that the seminar might well have been held at some point centrally located in the citrus belt, rather than at Gainesville, owing to the inaccessibility of that city, all are united in appreciation of the good work which has attended these annual gatherings and the great efforts which have been put forth by the University faculty in behalf of the citrus growers.

Dr. Wilmon Newell, dean of the agricultural department of the University and his faithful and efficient co-workers have won the esteem and confidence of Florida growers in a high degree by their tireless efforts to make the seminar of value to the industry. The program last year was one of the best in the history of the seminars and every grower in attendance must have gained many new and valuable ideas applicable to his own grove work.

It is to be deeply regretted that lack of funds makes impossible the holding of the seminar this year, and it is to be hoped that some provision may be made whereby these annual meetings may be resumed next year and continued each year thereafter.

CAR SHORTAGE THREATENED

The threatened car shortage is causing considerable apprehension among the shippers of perishable fruits and vegetables.

In response to inquiries, the Traffic Department of the American Farm Bureau Federation has been studying the situation to find the actual condition. A table has been compiled showing the number of cars loaded in the entire United States by weeks from February 4 to July 8. Since February the carloadings have been running higher than in 1921, although less than in 1920. Fewest cars were loaded during the week ending April 15, there being 706,713 cars loaded that week.

Weekly carloading in spite of the shortage of approximately 60,000 cars in coal loading is still in excess of the loading prior to April 1, 1922, of the corresponding weeks of 1921, and is not

much under the heavy volume of business for 1920. The surplus of all cars has dropped from 371,221 to 239,160 cars. The surplus of box cars has dropped from 138,214 to 61,067 cars, and in spite of the coal strike the available surplus of coal cars has dropped from 186,508 to 146,743.

Up to July 1st the total loading of bituminous coal was nearly as great as the loading up to July 1, 1921. During the first six months of this year there were loaded about 3,420,000 cars of bituminous coal. During the first six months of 1921 it was about 3,620,000.

The Northwest gets its supply of coal very largely from the docks at Duluth. In order to take care of this situation it is necessary that the docks be filled four times each summer. So far this year the docks have not been filled once and the shortage of coal is materially restricting the operation of lake vessels. It is becoming increasingly difficult to find ships that will haul grain to Buffalo and the contract rate has increased from 2½ to 3 cents per bushel on coarse grain within the last few days. Both of these factors point to an increased use of box cars this fall.

The American Railway Association states that on June 15 there were 332,681 cars needing repairs of which 268,305 required heavy repairs. The American Railway Association says that the percentage of bad order cars June 1 was 15. And on June 15 was 14.6. If these figures are comparable with those of the Interstate Commerce Commission then from April to June there was a considerable backward movement in the repair of freight equipment.

Traffic Manager C. B. Hutchings believes, and his investigations corroborate his belief, that a heavy car shortage is due in the fall regardless of impending strikes.

Present indications are that Florida will produce a citrus crop this year fully as great as last season. This estimate is made, of course, upon the assumption that the fruit set from the June bloom will hold. In best informed circles, the orange crop is expected to exceed that of last year, while the grapefruit crop will be less.

The indications are that the Florida crop this season will be of excellent quality, running to much larger sizes than last season and of extreme juiciness. The percentage of "fancy" and "bright" fruit is expected to be much higher than in recent years.

The growers of Florida never had access to as favorable marketing facilities as will be available for the coming crop. Every distributing agency in the state is preparing to render increased efficiency in service during the coming marketing season.

Young groves, some of which were badly affected by the early season drouth, have been fairly out-doing themselves in the matter of growth since the rainy season has finally gotten under way.

Having produced a good crop, the wise grower will take steps to protect his crop and trees with grove heaters.

Numerous Varieties of Citrus Fruits Introduced by Europeans, States J. N. Morrison

By Eleanor Bisbee

Nineteen kinds of citrus fruits are all budded on seedling lemons at the Charles Deering estate in Buena Vista. The budding was done about March 1, each bud being set on the seedling about eight inches above the surface of the ground, the upper part of the young tree being lopped over. When the bud takes hold and begins to put out shoots the upper part of the seedling is cut off.

Many tourists assume that citrus fruits are an old story in Florida, having probably been part of the daily menu of the Indians. That may have been true to some extent, but the facts as given by J. N. Morrison, manager of Mr. Deering's place, are that citrus fruits are not really natives of Florida, but are a Spanish introduction. The fact that lemons, limes and oranges have become thoroughly naturalized and now grow side by side with native trees in the hammocks, lends color to the belief that they are indigenous. "Probably," states Mr. Morrison, "all our cultivated forms of citrus fruits had their origin in the Malay archipelago, and there were no citrus trees growing on the Florida peninsula before the advent of the Europeans."

Hard to Classify

Original wild forms are said to have practically disappeared, which makes classification of modern varieties more difficult. Some original forms may never have been discovered. Systematic pomologists are said to have run up against countless complications in attempting the classification of citrus fruits, with the final result that the principal different forms have been designated as different species.

Consequently, although they are obviously related to each other in some way, grapefruit, oranges, lemons, limes and many others are counted as separate species. In the Deering grove there are about 18 varieties of citrus fruits. Among oranges there are the Temple, Pineapple, Zumwalt, Hart's Late, Lue Gim Gong, King and Jaffa. Limes include Kusale, Tahiti, Rang and Calamondin. Then there are the Marsh Seedless and Foster pink grapefruit, the pink shaddock, the Villa Franca lemon, the

tangerine, kumquat and tangelo.

Seedlings Less Common

Citrus trees may be propagated by budding, by grafting, by cuttings, by layering or by seeds. Budding, however, is by far the most common method in the present day. According to Mr. Morrison, 60 years ago or even more recently it was the rule to plant seedling citrus trees, and now it is the exception. Also in former days, methods of combatting insects and fungus diseases were less perfectly understood than now.

In those days, it is said, the fertilizers applied to the soil were mostly made at home, but now nitrogen, potash and phosphorous, deemed essential for the production of first class fruit in many districts, can be obtained readily as commercial commodities.

Referring again to the seedling groves, Mr. Morrison states that from them many of the prominent varieties now so commonly planted were first selected, and he adds, "this is one of the reasons why seedling trees should not be condemned and the planting of seeds for the purpose of originating new varieties is certainly commendable."

Almost any combination can be worked out by budding. Two trees on the Deering estate are each bearing six kinds of fruit, for each one has had budded on it, grapefruit, two varieties of oranges, kumquats, limes and tangerines.

PROTECTING THE GROVES

"Preventive measures to protect the Citrus crop from frost damage this winter are being made on a much larger scale than heretofore," said Mr. A. M. Paul, Assistant Manager of the California Fruit Growers' Supply Company.

"The unusual freeze of last winter opened the growers' eyes to the necessity of adequate orchard heating. Many methods proved themselves wholly inadequate; coal burning heaters have had to be abandoned due to the necessity of refilling them about every three hours when burning with the attendant high cost of night labor.

"A committee of the Exchange growers got together and recommended an oil burning Orchard heater of the smokeless type having a sufficient

capacity to burn all night without re-filling. It is this heater which has been approved by the Fruit Growers' Supply Company.

"With the thousands of oil burning smokeless heaters now in use, and those which will be added before the Winter arrives, it looks as though Jack Frost will have an extremely difficult time making any serious inroads on California's great Citrus crop.

"The Fruit Growers' Supply Company is the purchasing organization for the Citrus growers, who are members of the California Fruit Growers' Exchange, and through this company immense orders are placed for all kinds of packing house supplies and other materials needed by the growers in the production of the Citrus crop. This Company has awarded the contract to furnish their entire requirements of Orchard Heaters to the American Can Co., of Los Angeles, and Toledo, Ohio. It is stated that that concern has added largely to its equipment in order to produce the quantity of heaters to be required by the Orange and Lemon growers this winter."

VEDALIA WILL CONTROL

COTTONY-CUSHION SCALE

The cottony-cushion scale increases very rapidly and is capable of killing the tree outright unless control measures are taken. They are found mainly on citrus, but also infest roses, wormwood, myrtle, mulberry, many weeds and ornamentals.

The only permanent and satisfactory method of controlling this scale in a large grove, is by the introduction of the Australian lady-beetle (Vedalia). Vedalia is much smaller than most of the native lady-beetles being only one-eighth inch long. It is cardinal red in color, spotted and fringed with black. The larva, which also feeds on the scale, is likewise red.

Vedalias are supplied to growers at the cost of rearing by the State Plant Board. If trouble occurs from cottony cushion scale and the Vedalia is not present, write Dr. E. W. Berger of the State Plant Board, Gainesville, Florida.

It has been said that for every 147 cattle in Florida, only one is a purebred; while ten other southern states better this, ranging from Tennessee which has one purebred to every 47 up to Louisiana which has one purebred to every 124. Obviously, we of Florida know this shouldn't be. But what are we doing about it?

"The guiding principle of our organization is that we have no right to succeed unless we are of real service to the community in which we operate."

We have succeeded and believe we have been of service.



Why Growers Ar

The friendly feeling toward our organization, which is evidenced daily, as well as the enormous patronage which we enjoy, no doubt is due in part to the extremely comfortable financial position we occupy, but there is another phase which presents a deeper and more significant reason—we are known to be fair in all our dealings. We are constantly working for the interest of all growers, and being the larg-

Standard Growe



Orlando, -

Owned by

DiGiorgio
Corpora



We strongly recommend all growers joining the Florida Citrus Exchange—but if you cannot at this time, it behooves you to sell to us; as we are a member and our shipments help to strengthen that rapidly growing growers' organization which protects every grower of citrus fruit in Florida.

Think This Over

Are Appreciative

est growers of citrus fruits in Florida, our efforts are known to be sincere and continuous.

Mr. Grower, if we can extend you any assistance that is consistent with sound business principles, see our representative, or write our main office.

Flowers Exchange

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Standard Growers Exchange Has Successful Year

Mr. V. B. Newton, treasurer of the Standard Growers Exchange, when interviewed at his office in Orlando several days ago, stated that the fiscal year ends August 31st, and beyond all question of doubt it had been the most successful in the history of the Company.

Mr. Newton continued by saying: "Our operations are divided into three branches, namely, citrus, vegetable and peach and while we buy a considerable amount of each of the commodities handled by us, the greater portion is from our own groves, farms and orchards.

"Our citrus operations last year were considerably larger than they have ever been in any one season heretofore, they were also handled in a manner different from any previous season as we became affiliated with the Florida Citrus Exchange in August, 1921, and all of our citrus fruits were shipped through that organization. At the present time we own over 3000 acres of orange groves in Florida and have long term leases on about 500 acres. We expect our groves to produce this year in the neighborhood of three quarters of a million boxes of citrus fruit."

In discussing the Standard Growers Exchange affiliation with the Florida Citrus Exchange, Mr. Newton advised that it had been most satisfactory and predicted that within the next few years the Florida Citrus Exchange would be handling 75% of all citrus fruit produced in the state.

"The growers of Florida have had an opportunity" he said, "to see the benefits derived from co-operative marketing by the results obtained by growers that have shipped through the Exchange, as well as having an opportunity to gather information as to the progress made by California citrus growers, the greater portion of which has been due to cooperative marketing. In a number of instances growers have hesitated to join the Exchange on account of the fact they were greatly in need of financial assistance. The Exchange, however, is in position at the present time to take care of the majority of their growers but in some cases where the growers felt that they preferred not to take the risk of market conditions and desired to sell their

fruit at the present time, they have shown our organization preference, this being due to the fact that they knew our shipments would go through the Florida Citrus Exchange and greatly strengthen that growers organization. Understanding further the Florida Citrus Exchange was of great assistance to all growers in the State and desiring to assist them in any way they can, have incidentally helped the Standard Growers Exchange by throwing considerable business our way. I conscientiously believe that 90% of the growers of Florida believe in the Florida Citrus Exchange and realize that it has been one of the principal factors in making the citrus industry in Florida a success. I believe further that 90% of the growers anticipate joining the Florida Citrus Exchange sooner or later, and realizing the benefits that will accrue to all growers as soon as the Florida Citrus Exchange has a substantial control of shipments of citrus fruit, and further since we are the largest growers of citrus fruit in the state, we look forward with much pleasure to the day when the Florida Citrus Exchange will control at least 75% of the fruit shipments from this State."

In referring to the Standard Growers Exchange vegetable operations, Mr. Newton stated that they owned something like 4000 acres of vegetable land in Florida and that last season about 2500 acres of this amount was planted in tomatoes, and that the vegetable operations were the most successful in the history of the company. When asked what acreage they expected to plant this year, Mr. Newton stated that this was a question he was unable to answer as the vegetable operations were under the supervision of their Mr. Christman, who was now in Georgia closing the peach deal.

In dwelling upon the peach operations, Mr. Newton stated that while this year's peach deal was a very difficult one to handle in view of the fact that the quality of peaches was very irregular and that the various varieties ripened out of their usual season during the entire deal and there was considerable brown rot and worms, but taking everything into consideration, their peach opera-

tions this year were crowned with success. "Our success this year in the peach deal under such adverse conditions, we attribute largely to the fact that we were fortunate in having with us, Mr. B. J. Christman, who for years was manager of the Georgia Fruit Exchange and who unquestionably, in our opinion, is the best peach operator of this day," said Mr. Newton.

The Standard Growers Exchange is owned by the DiGiorgio Fruit Corporation of New York, which corporation is reputed to be the largest growers of fruit and vegetables in the world, they now owning in the states 61,000 acres of producing land. Its president, Mr. Jos. DiGiorgio, is possibly the best known fruit man in America and has been very successful in all of his undertakings.

LAKE WALES SHIPPED

134,925 BOXES CITRUS

A total of 134,925 boxes of fruit were shipped last year by the two packing houses operating in Lake Wales. This is almost exactly twice the amount of fruit shipped the year before for the season of 1920-21 when 67,000 boxes of fruit were sent out by the Exchange packing house. Not all of the fruit shipped from here last season came from territory strictly in the Lake Wales district, some of it being shipped in from territory nearby to be packed here, but this was probably fully offset by the fruit shipped to other houses to be shipped. For instance Gentile Bros. packing house at Frostproof packed fully 10,000 boxes of fruit bought of Lake Wales grove owners.

Many of the groves in the Lake Wales territory are not yet producing at all and many others are at nowhere near full capacity. This is a new territory and the number of boxes of fruit shipped from this station will increase year by year for 10 or more years to come.

It has been said that the man who burns weeds and grass in his field rather than plow them under as humus is guilty in the first degree of arson. One real dirt farmer said, "Suspect there's a bit o' laziness in that man, too."

Fruit Fly Which Worries South African Growers

Citrus growers of South Africa are constantly menaced by the "fruit" or "peach" fly. The South African Fruit Grower asserts in a recent issue that this pest has practically destroyed some of the orange groves in the eastern part of Cape Province.

This pest has not reached America yet but there is ever present the possibility that it might slip by the watchful quarantine officers at the several ports and if it did the grower would have just one more problem to struggle with.

The following is a digest of a recent article in the publication mentioned in the opening paragraph, and is presented because the American grower is interested in everything that his fellow grower has to combat.

It is first stated that the fruit or peach fly attacks every kind of fruit but exhibits an especial fondness for oranges and peaches, hence its name. The fly digers from the codling moth inasmuch as it is found in great numbers in a single fruit whereas it is rare to find more than one moth grub in one fruit. The fruit begins to decay as soon as the maggots of the fly start feeding.

"The treatment in control of this pest must be of a preventive nature. It is necessary to destroy the fly before it lays its eggs. The eggs are deposited under the skin of the fruit when approaching its ripening period.

"The spray used most successfully in South Africa is known as the Mally Fruit Fly Bait. As it is a bait it must be used sparingly. A fly when emerging from the pupa, immediately hunts for food. If the bait is there, the fly will take a sip of it and die.

"The Mally Fruit Bait consists of: Two pounds or three ounces arsenate of lead (paste). Forty pounds or four pounds of brown sugar or four gallons or one-half gallon treacle. Forty gallons or four gallons water.

"It is most economical to apply the mixture with a garden syringe. A teacup will serve for a large sized tree. It should be applied evenly. The syringe should be shaken occasionally to keep the arsenate of lead in suspension. An ordinary spray pump with a coarse nozzle may also be used if the liquid is applied in little squirts in such a manner as to allow it to fall on the tree from above. * * * The spray should be applied at intervals

of 10 to 14 days. If a rain occurs, another application is necessary.

"Any fruit that is allowed to remain on the tree will become infested and fall to the ground. If it remains there, it will rot and the juice will soften the ground under it. The maggots work their way through the moist earth and hibernate about a half inch below the surface. This forms a cryalis and a new batch of flies will be hatched. If a maggot should drop on hard earth it will leap until it can find a spot

soft enough to burrow in. A large maggot can leap quite a ways by folding its head to its posterior and jerking suddenly apart.

"No fruit should be allowed to lie and rot on the ground. After each picking, all fallen fruit should be sorted and utilized if possible.

"If the ground below the trees is scuffled after each picking, the hibernating pupae will be exposed to its enemies, such as ants.

"Oranges are a source of the fly being carried through the winter months so this fruit should be given strict attention and sprayed from March until the early frosts, and all fallen infested fruit should be gathered and buried."

New Packing Houses for American Fruit Growers

Deals have recently been consummated for the purchase by American Fruit Growers Incorporated of two additional citrus packing houses in the Indian River territory, one being the packing house of the City Point Citrus Growers' Association, located a few miles north of Cocoa, and the other the packing plant of the Smyrna and Hawk's Park Citrus Growers' Association, at New Smyrna.

These two houses will be immediately overhauled and put in first class shape for the opening of the coming packing season, and with the plants heretofore operated by the American Fruit Growers will give that company a total of six modern citrus packing houses in the Indian River territory.

The American Fruit Growers Incorporated is the largest handler of fruit from the Indian River section, it having handled last season more than one-third of the total output of that district. The purchase of these two additional houses reflects the steady development of the company's business and affords the necessary facilities for taking care of its rapidly increasing output from that section.

A large new packing house is also being constructed by the Weirsdale Packing Company at Weirsdale, Florida. This plant is located in the center of production of the genuine Parson Brown orange and will pack a large volume of this early fruit as well as Pineapple oranges and other fruit from that section. The output of this house will also be marketed through the American Fruit Growers Incorporated.

A. M. KLEMM AND SON TO DOUBLE CAPACITY OF PACKING PLANT

So many growers have decided to take advantage of the opportunity to ship their fruit under the well known brands "Belle of Winter Haven" and "Booster" that A. M. Klemm and Son have decided to enlarge their packing house to nearly double its present capacity. Work has already started, the Brogden Company having charge of construction. New machinery, the latest and most improved to be had, has been ordered from the Skinner Machinery Company. Mr. Skinner and engineers and architect have been working together for several days and it is doubtful if there will be a house in the state as well equipped and arranged.

The entire house is of brick and fireproof throughout and when completed will have a floor space of 25,000 feet and a capacity of ten to twelve cars a day. The past season, Mr. H. A. Pollard, manager of the house, in order to get a pack which he had long desired, put the packers on a day basis instead of piece work and as there is no incentive for a packer to slight his work a pack has been completed that has brought numerous compliments from the trade in the northern markets and the American Fruit Growers Inc., through whom Klemm & Son ship all their fruit, report a big demand for this fruit. It has been decided to put the American Fruit Growers trade mark, "Blue Goose" and "A. F. G." on the label from this house and with this addition there will be no fruit in the state that will be better known.

Florida Shipper Predicts Good Crop and Prices

That Florida's citrus crop for the year 1922 will approximate 13,000,000 boxes is the belief of one Orlando gentleman who is prominently identified with one of the largest citrus organizations in the state. In discussing the outlook for the citrus crop recently this gentleman expressed the belief that the Florida crop this year would exceed the output of the 1922-23 season. In spite of the big crop estimated this citrus factor believes that satisfactory prices will prevail, due to the larger sizes and better quality of fruit indicated for this season and to the excellent demand for citrus fruits which has been maintained throughout the shipping season of both Florida and California fruits.

In estimating the size of this year's crop, an increase in oranges is anticipated with a decrease in grapefruit. But for June bloom and the many new groves coming into bearing, the grapefruit crop of the present year must have been materially less than that of the past season. Even under the present improved conditions, the grapefruit crop will be light.

In discussing the outlook both as to yield and price this gentleman outlined the reasons for his conviction on both points as follows:

A combination of erstwhile elemental conditions must be taken into account when arriving safely at the foregoing conclusions, bearing in mind that there is still some variance of opinion concerning the exact number of boxes the growers yet may harvest.

With the very early advent of spring weather the groves came forth uniformly with a historically heavy bloom especially on orange trees, and premature estimates of well-versed authorities placed the outlook at 15,000,000 boxes, provided that seasonable rains and other normal conditions prevailed; but the most important of these, that of rain, failed, and it was late in May before it rained enough generally in the so-called citrus belt to moisten the ground as much as half an inch altogether. Meanwhile the embryo fruit began giving way against the hot dry days, so that by the middle of May some of the larger growers and shippers admitted freely that the crop was cut almost by half.

On the higher ridges the groves were literally stripped of bloom and the trees seemed to be in danger of suffering tellingly from the drought. On the lower stratas, however, along the lake sides and where grove owners had provided for and employed artificial irrigation a fairly satisfactory portion of the bloom set to fruit but it was "a survival of the fittest." Ordinarily and with ample rainfall the fruit would have set in clusters, one unit crowding out the other for space and position throughout the summer months, with the result that the trees would have sagged heavily under the burden early in the growing period and produced much smaller sizes.

Fruit Will Be of Good Size

As it was, one to three young oranges or grapefruit, as the case may be, were sustained on a limb that otherwise might have struggled on under seasonable rains with twice or thrice that number. This condition prevailed throughout the trees, so that now the predicted large sizes are assured, and in a very remarkable degree as a consequence of such uniform distribution throughout the branches.

Grapefruit bloom was not so profuse nor did the trees stand up under the weight of the drought as staunchly as the orange.

When the late May rains began falling it was recalled that the "shock" caused by a sudden rising of sap would bring out a heavy June bloom, and in a notable measure this was the case. A great many of the hard-hit groves put on a second bloom almost sufficient to offset the early spring losses, and it has set fairly well in most citrus sections.

Nor were the larger prevailing sizes the only benefits derived from the drought, for both the white fly and the rust mite were routed from the groves and annihilated to a great extent by the hot dry days of April and May, thereby scoring another point for the grower in the quality of the present crop.

This very promising outlook is gained through a survey of a large portion of the entire citrus belt, and an outstanding feature of conditions is found in the excellent sizes already showing clearly on the trees, the measure of which is likely to

swell the output enough to match, numerically, the harvest of last season, with the added feature of better prices to be obtained for larger and brighter fruit.

Behind the evident optimism among the larger packing and shipping organizations in Florida is the relative technical position of California and a consideration of the fact that oranges have brought better prices throughout the past year, comparatively, than the other fruit products of the country. While the output of peaches, apples, grapes and sundry other competitors to the orange has been fairly liberal, the prices realized were nothing startling, although the markets have absorbed the entire yield. Nevertheless, oranges have sold at what might be termed a premium.

Those in close touch with facts governing market conditions for the forthcoming season are taking into consideration that the California Valencia, Florida's early season competitor, will be cleaned up before the Florida crop begins rolling. A year ago California had approximately 10,000 cars to move at this time of the year as against some 3,000 this year, and the navel, the midwinter competitor, is stated by those fully acquainted with the situation, will not exceed next winter more than 75 per cent of last year's production.

BOUIS BUYS ANOTHER GROVE

Sale of the property known as the Willingham grove is announced following failure of negotiations for its purchase about three weeks ago. The buyer was S. G. Bouis, of Baltimore, Md., who has acquired grove interests in Florida amounting to six or seven hundred acres, which he operates under the title of the Florida Fruit company. Mr. Bouis was in Arcadia recently in connection with the deal.

Early in May it was announced that negotiations for purchase of the property were being carried on by local attorneys for Walter McNeill, of Savannah, Ga., and V. H. Miller, of Bartow. The owner was Baron Quarles von Ufford, of Lakeland and Holland, who bought the grove property from W. J. Willingham in May, 1920. The price paid by the baron was said to have been \$135,000. What Mr. Bouis paid has not been made known.

Butterfly Which Defoliates Nursery Stock and Young Trees

"Swallow-Tail Butterfly Injurious to California Orange Trees" is the title of an article by J. R. Horton of the U. S. Bureau of Entomology, published in the last monthly bulletin of the California department of agriculture.

The author states that when engaged on the citrus thrips problem at Lindsay, California, a few years ago his attention was called to nursery trees which had been partly or wholly defoliated, and the tender shoots of which were often severely damaged by large yellow caterpillars.

"Less frequently," continues the writer, "young orchard trees were the object of heavy infestation, and few were entirely free from injury. As many as 50 eggs and caterpillars have been counted upon a single one-year old tree, and at times an entire orchard would average 15 to 20 per tree. While the insect cannot be classed as a major pest and these examples represent the extremes of injury that may be expected, it is distributed through the California citrus belt and annually causes a varying amount of injury to young orange trees. The caterpillar feeds almost entirely upon the tender leaves and stems of new growth, but more rarely upon the blossoms also. Owing to its fondness for parsley and related plants it has sometimes been called the "parsley caterpillar."

"The parent insect is a large, snowy yellow and black swallow-tail butterfly, measuring with wings extended from $2\frac{1}{2}$ to $3\frac{3}{4}$ inches. It is most frequently seen and most conspicuous butterfly occurring in California orange groves, especially those of the San Joaquin Valley and will be found flitting about over beds of native and cultivated flowers in early spring, and in the orange groves throughout the summer."

On the subject of the eggs Mr. Horton states that they are easily seen against the bright green of the new orange growth on which they are nearly always deposited. The average period for incubation was found to be 9.2 days although some were hatched in four days. The life of the caterpillar was found to be shortest in the months from May to October. Those hatched from March to May and from November to January live twice as long as the summer hatch. The shortest lived caterpillars lived 25 days and the longest was 114

days. The average life was 46.6 days, according to this writer.

Describing the butterfly Mr. Horton says that the adult is a large black and yellow-tail one. The fore wings are black crossed by a broad oblique yellow band which is divided in eight parts by the black veins. On the inner side of this band, are two yellow lines and a yellow patch. The hind wings have a broad, black border, enclosing a series of five or six yellow spots, between which are clusters of light blue scales. Near the hind angle is an orange or brown ring, enclosing a round or oval black spot margined above with a blue crescent; the narrow tail entirely black. The body is entirely black except for a yellow or brownish stripe along the sides; legs and antennae black.

On the subject of food Mr. Horton says that the adult subsists chiefly on the nectar from the blossoms of many wild and cultivated plants, including orchard trees. The life cycle of the

butterfly is on an average 61 days. There are three or four generations each season according to the writer.

Among the chief enemies of the butterfly in the Tulare county groves is the larva of the "golden-eyed fly" (*Chrysopa californica*), which punctures and drains the eggs. In one check it was found that 90 per cent of the eggs on young trees had been thus destroyed. Young caterpillars are attacked by this insect and spiders.

On the subject of control Mr. Horton asserts that the caterpillars readily succumb to weak arsenical sprays—prepared at strengths which preclude danger to trees or fruit. Control measures should be adopted between May 15 and June 15 and in some instances during July and August.

It is recommended by Mr. Horton that the owners of nurseries and young orchards carefully inspect their trees for eggs about the middle of May and again in July.

Standard Growers Exchange Purchases Lynchburg Grove

The Standard Growers Exchange recently consummated a deal whereby they acquired the Lynchburg grove which is located in the heart of Polk county. This grove consists of approximately 300 acres of the most productive orange trees in the State of Florida. It is estimated that the crop from this grove this year will be around 100,000 boxes. In addition to the large bearing acreage there are about 25 acres of young Valencia trees that will come into bearing in a couple of years.

The Standard Growers Exchange for some time has been conceded to be the largest growers of fruits and vegetables in the state. The above purchase added to the already extremely large holdings, gives them over 3,000 acres of orange groves in Florida.

The Standard Growers Exchange is affiliated with the DiGiorgio Fruit Corporation, which is reputed to be the largest organization of its kind in the world and who are also said to be the largest growers of fruits and vegetables, owning over 61,000 acres of producing land in America.

With these facts before us and with

the Standard Growers Exchange rapidly increasing their holdings in Florida, it shows conclusively that this large corporation has great faith in the future of Florida.

The Standard Growers Exchange expect to produce on their own groves in the State this year something like three quarters of a million boxes of oranges. In addition to their extremely large holdings they have long term leases on several thousand acres and are also large purchasers of citrus fruit, usually buying each year around a million boxes.

The Standard Growers Exchange is a member of the Florida Citrus Exchange and handle all of their citrus fruits through that cooperative organization, they believing that distribution is the key note to the success of the citrus industry of Florida and that only by cooperative marketing can the proper distribution be accomplished.

If you haven't a county agent, get one. Then get a home demonstration agent to help your wife while the county agent helps you. You need their services more than ever.

Canned Grapefruit Soon to be Shipped from Manatee County Plants

(Bradentown Journal)

Bradentown is to have a new and important industry, or rather an important addition to an old and established industry. The Florida Grapefruit Juice Co., which has already solved the problem of pasteurizing and bottling the juice of the grapefruit, so that it absolutely retains its natural taste and color, and remains unfermented for years, is preparing to put out canned grapefruit, preserved and pasteurized by the same method.

This is no experiment. The experimental stage was passed when Mr. C. E. Street, after several years study of the by products of citrus fruits, produced a grapefruit juice that after two or three years could not be distinguished from freshly extracted juice, and which is now recognized and recommended by hospital dieticians and physicians all over the country. Exactly the same is the treatment of the ripened fruit fresh from the groves which the company will begin putting on the market this winter.

There have been many attempts made to preserve the grapefruit in cans but always it has resulted in a slushy mass of stewed fruit, without the real grapefruit taste or the firm consistency of the real fruit, sun ripened in the orchard. This Mr. Street claims will be furnished in the output of his factory this winter and proven by the stock prepared last winter and held to test the lasting quality of the process, instead of putting on the market.

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Orlando

Canned Grapefruit Soon to be Shipped from Manatee County Plants

(Bradentown Journal)

Bradentown is to have a new and important industry, or rather an important addition to an old and established industry. The Florida Grapefruit Juice Co., which has already solved the problem of pasteurizing and bottling the juice of the grapefruit, so that it absolutely retains its natural taste and color, and remains unfermented for years, is preparing to put out canned grapefruit, preserved and pasteurized by the same method.

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Twenty

Running water is no more important in the barn than it is in the home. Give the wife a square deal.

Florida's dairy herds must be improved and the purebred sire is essential to an improvement.

Paint not only improves the looks of the fence or the barn; it also makes them last longer.

CLASSIFIED ADVERTISEMENTS

The rate for advertisements of this nature is only three cents per word for each insertion. You may count the number of words you have, multiply it by three, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

THE CITRUS INDUSTRY.
411 Curry Bldg., Tampa, Florida

REAL ESTATE

FOR SALE:—Fifteen acres of best citrus land in the state. Improved and under fence with two room house. Ideal land for nursery, slightly rolling, well drained about quarter of mile from hard road which runs against farm, in sight of railroad station. Address Mrs. V. L. Hefner, Box 195, Tampa, Fla.

FOR SALE—The most beautiful grove property in Dade County consisting of 48 acres citrus, 10 acres avocados, and 40 acres timber land. All trees in bearing age and excellent condition. Value of present crop \$10,000; next year's crop should bring \$20,000. Beautiful residence. Price \$45,000. 1-3 cash. Dr. J. Peterson, Homestead.

I WANT FARMS for cash buyers. Will deal with owners only. R. A. McNown, 346 Wilkinson Bldg., Omaha, Neb.

MISCELLANEOUS

EARLY BEARING Papershell Pecan trees, budded or grafted and guaranteed. Great shortage this year. Write for catalog today. Bass Pecan Company, Lumberton, Miss. No. 54, Tampa, Fla.

PAPER SHELL PECAN GROVE. Most trees 12 and 13 years old, which is full bearing age. Good condition. Forty acres. Located near Monticello, Fla., Price \$500.00 per acre. Simpson Orchard Co., Vincennes, Ind.

WANT to hear from owner having farm for sale; give particulars and lowest price. John J. Black, 180th Street, Chippewa Falls, Wisconsin. Dec. 31

THE CITRUS INDUSTRY

FOR SALE—A large, airy nicely furnished cottage at Haven Beach, between Yatch Basin and the Gulf; price \$4000.00, terms, half cash and balance two years. H. W. Hesterly, P. O. Box

NURSERY STOCK

BROTHER:—Pleasant Florida root easily, inexpensively overcomes any tobacco habit. Fine for stomach. Send address. R. B. Stokes, Mohawk, Florida. 2t

FOR SALE—Dairy and stable manure, car lots. Link & Bagley, Box 2461, Tampa, Florida. Jan. 6t

MAKE EVERY DOLLAR COUNT! Buy your furniture here—pick from our complete stocks—be better satisfied. All goods marked in plain figures. We pay your transportation to and from Tampa and deliver your purchases free. HODGE & SHERMAN, Tampa, Fla.

FOR SALE—"Friend" sprayer 100 gal. capacity, new condition. Chas. Scott, R. F. D. 2, Bartow, Fla.

"Common Sense About Nitrogen" is the title of my latest Bulletin. It describes all the common forms of ammoniates used in fertilizers and explains the reasons why

Nitrate of Soda

should be more generally used. Write for the Bulletin. If you use fertilizers at all, you should know what they may be expected to do for you.

Dr. William S. Myers, Director
25 Madison Avenue New York

H. Harold Hume, Wm. P. Simmons, President. Vice-President D. A. Morrison, Jr., Secty. & Treas. BEST FERTILIZERS, INSECTICIDES, SPRAYERS, POULTRY SUPPLIES. Honest Goods, Fair Prices, Prompt Shipment. Ask your neighbor—He Knows Get NEW JULY 1st Price List, JUST ISSUED.

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No Job Too Intricate

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COME TO TAMPA AT OUR EXPENSE!
We refund transportation to purchasers and pay freight. All goods marked in plain figures. You can save money here and be better satisfied. HODGE SHERMAN, Tampa, Fla. Nov. 11

HOTEL HILLSBORO

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TOP O' THE TOWN

European Plan, Fireproof 300 Rooms With Baths

THE CENTER OF TAMPA

If You Want a Superior Grove
Plant "Superior Nurseries" Trees

SUPERIOR NURSERIES

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